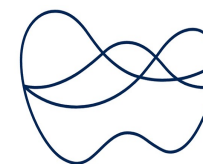


Leman Poseidon • CO₂ Injection Test

Presented by Louis Hannecart • Perenco CCS Manager

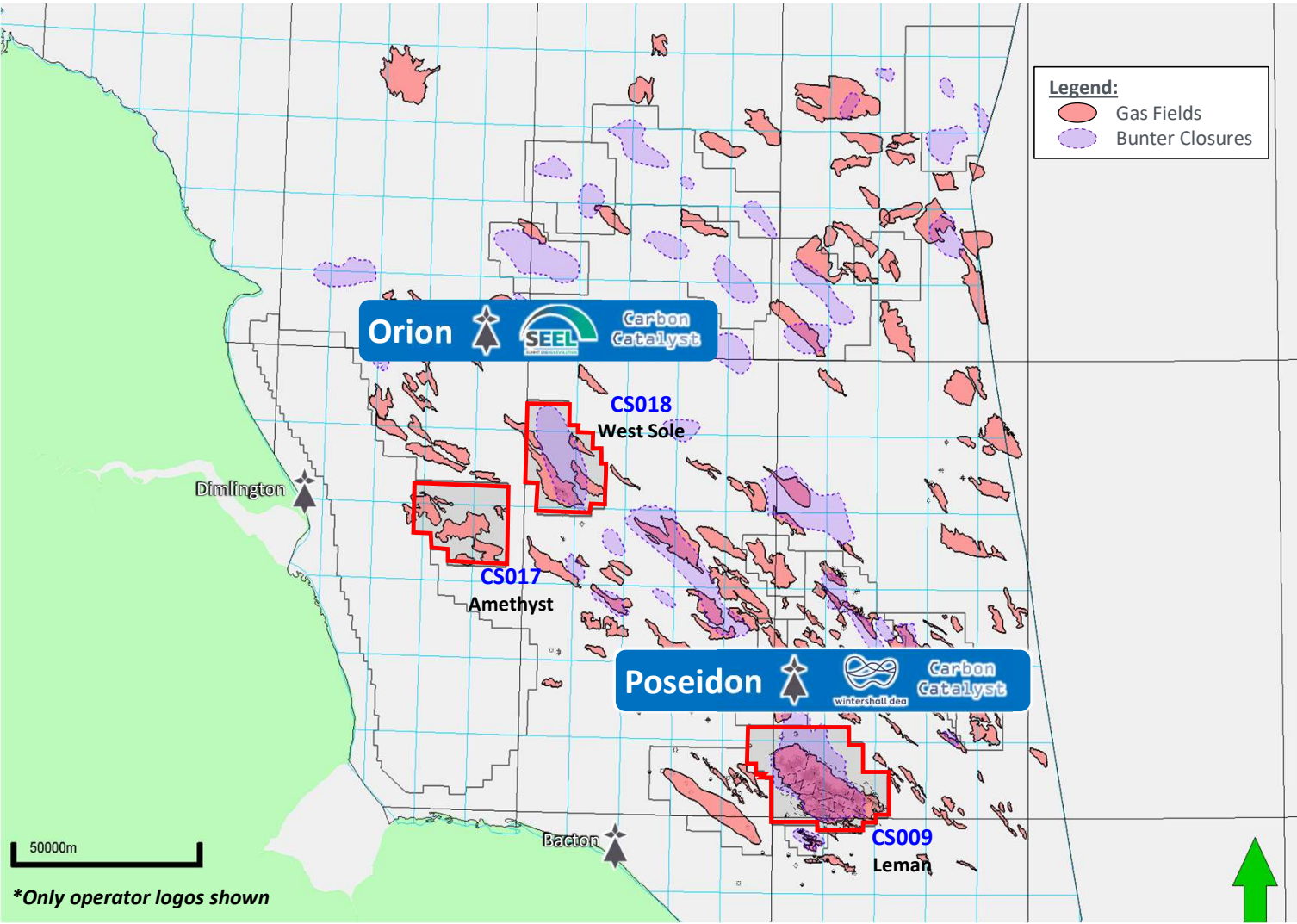


Carbon
Catalyst



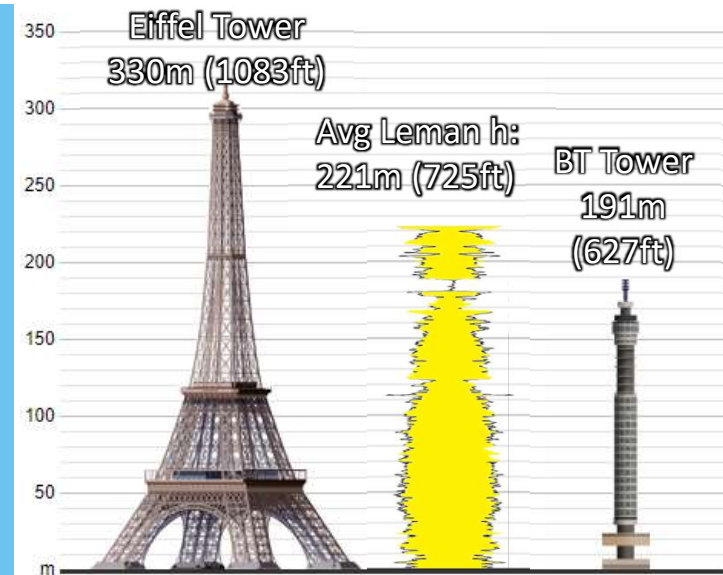
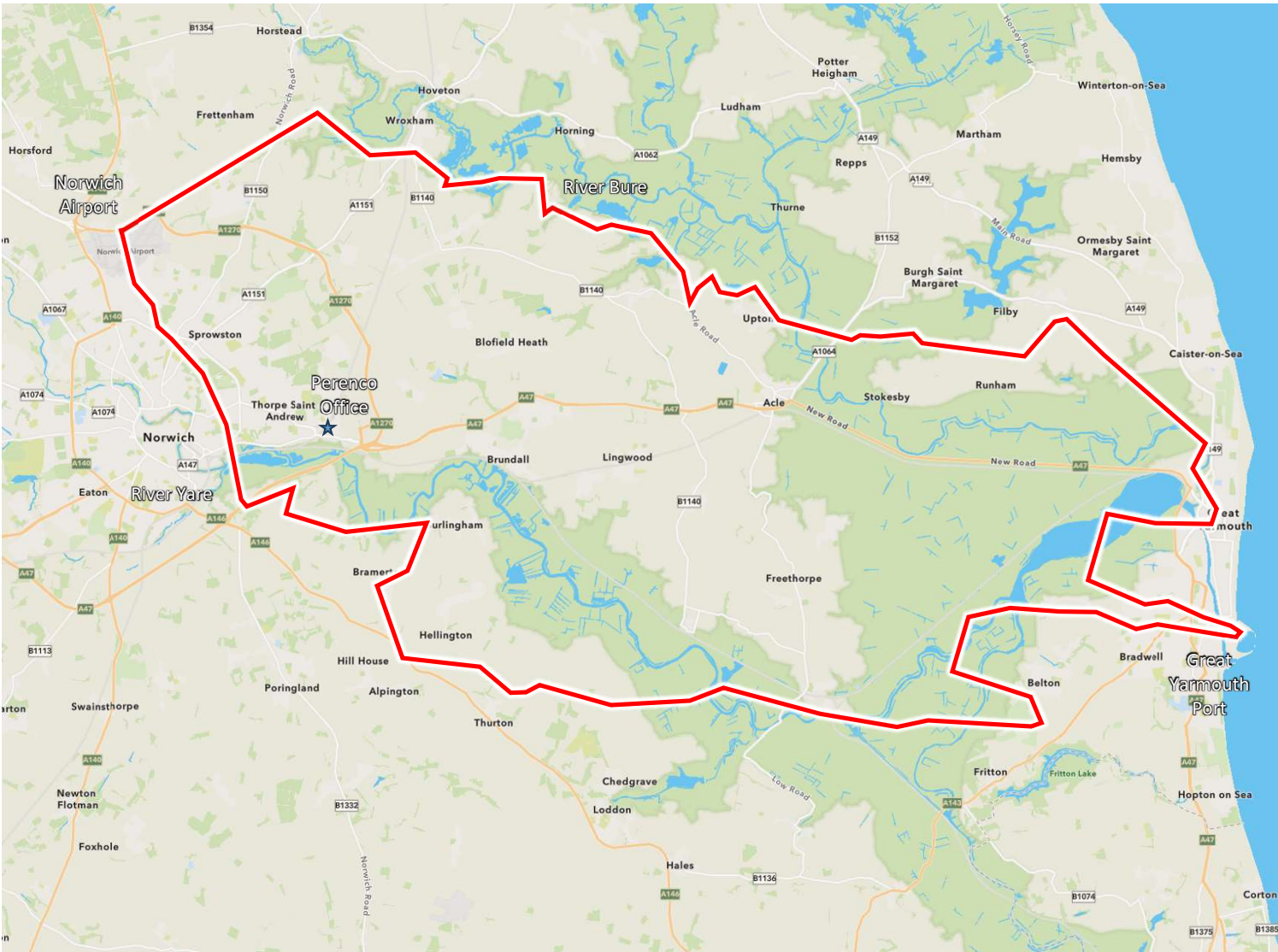
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Perenco CCS Licences in the SNS



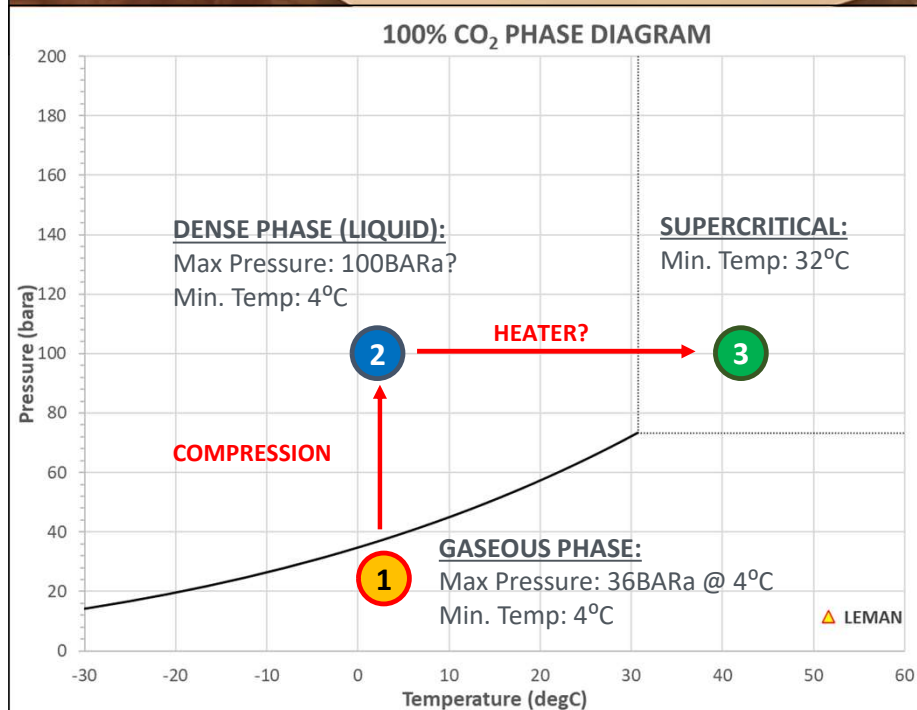
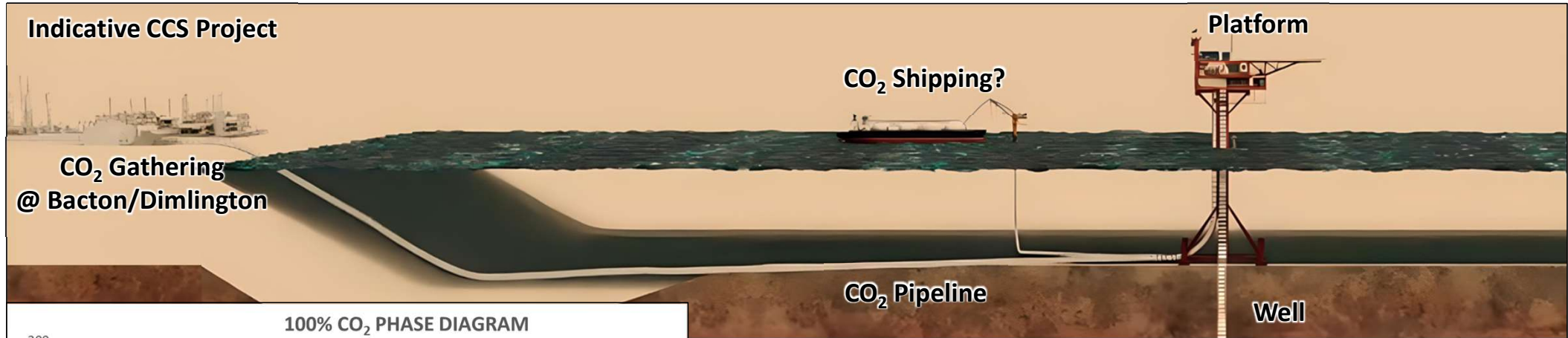
- **Three licences awarded** by the NSTA to Perenco operated JV
 - **CS009:** Leman + BC-9 (Poseidon)
 - **CS017:** Amethyst (Orion)
 - **CS018:** West Sole (Orion)
- **Focused on depleted reservoirs** (Leman/Amethyst/West Sole)
- **Diversified emitter sources from 2 potential CO₂ gathering stations**
 - Bacton
 - Dimlington
- **Committed work programmes**
 - 1 FIRM wells/tests
 - 1 CONTINGENT wells/tests
 - 2 CONTINGENT new seismic acquisition

Leman Poseidon – UK's largest gas field : 14.5 Tcf



- Highly compartmentalised
- Option to Develop Segment-by-Segment
- Ultra depleted <20bar

A test to assess all scenarios faced in development case



1. Gas Phase Injection

- Winter sea conditions minimum temp @sea bed = 4°C
- Small pressure headroom, requires heating to increase pressure
- Gas only at the start of project, will still need liquid phase in future

2. Liquid Phase Injection

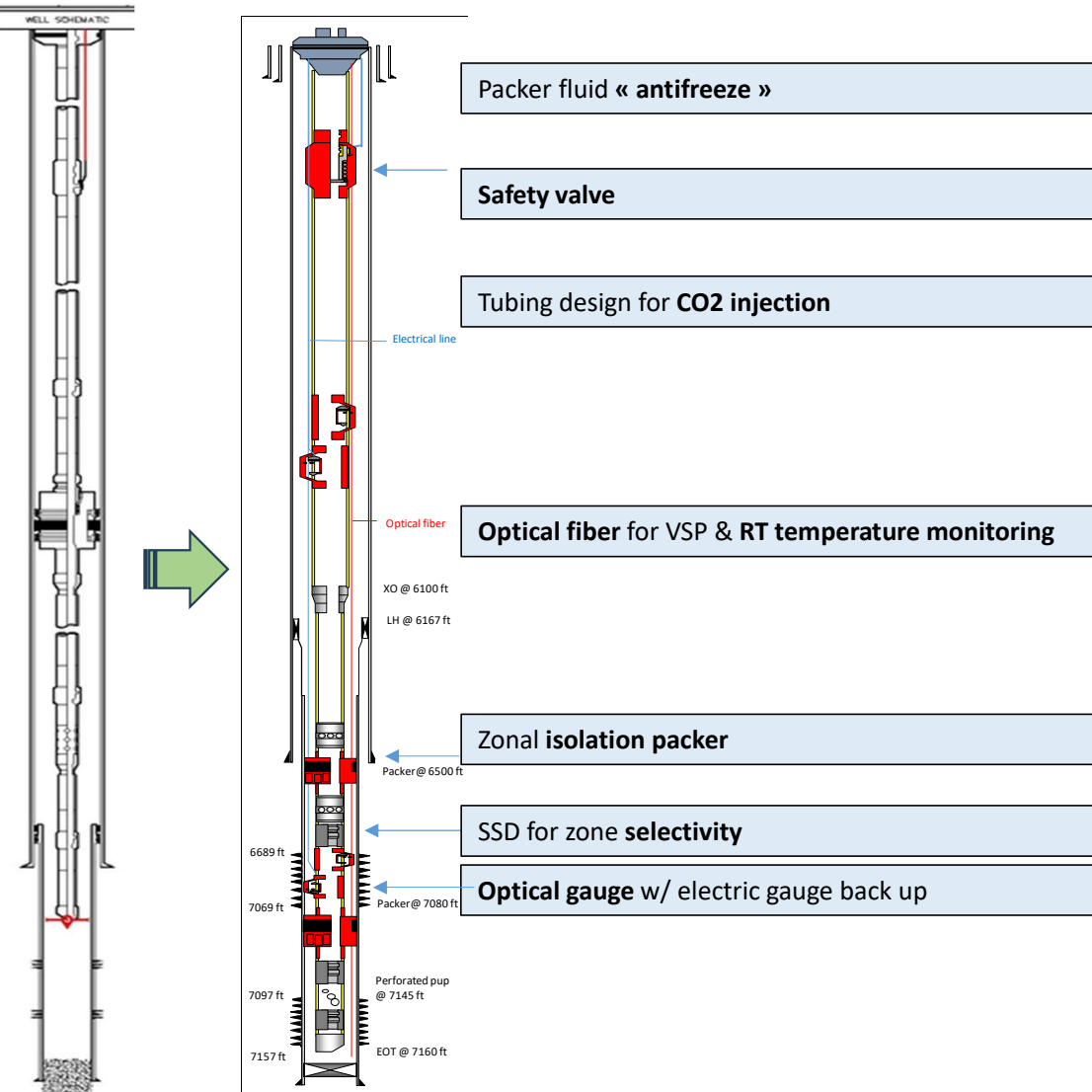
- With liquid phase, more CO₂ can be transported in pipelines
- How do we keep CO₂ in liquid phase from wellhead to reservoir at depleted reservoir conditions?

3. Supercritical Phase Injection

- Requires heating but safe from J-T cooling effect

Injection Test = cover scenarios for Development Case

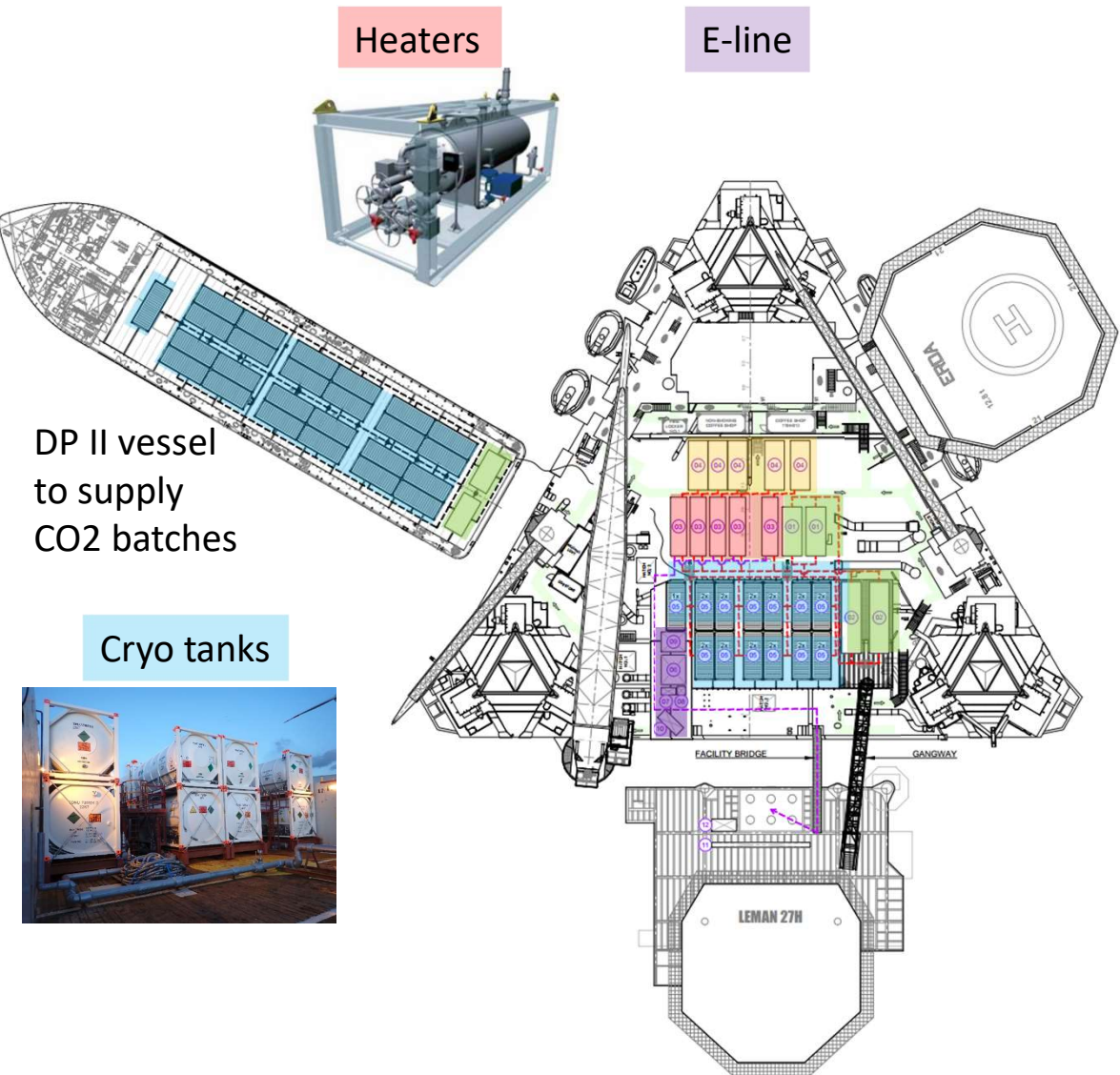
Test well design



Test well design goals

1. **Selectivity of injection zones**
2. **Injection data monitoring**
 - Optic fiber
 - 2 sets of optical P/T gauges
 - 2 sets of back up quartz electrical P/T gauges
3. **MMV technology proving**
 - Model calibration
 - Technology assessment

Offshore set-up



- 3 Months operation starting EOY 2024
- Rig combined operations with Leman platform
- Bridging document : PUK, Rig and Vessel operator
- Vessel tanks operating crew
- ERDA tanks operating crew
- Project members facilitating in HAZID & HAZOP
- Training of crews to handle CO₂ tanks and transfer



Take away

- Ambitions to turn the Leman capacity in **large scale storage**, with possibility of early start in available COP segments
- Injection test will be **industry first in UK North Sea** ; it will derisk a large portion of the **regional portfolio**
- Highly **visible in emitters' community** - domestic UK and continental
- **Execution challenge** : limited contractors experience, qualification ongoing on several equipment
- Opportunity to insert **execution** in the current Perenco SNS decommissioning activity
- Full **regulatory process** required and ongoing for this first CO2 application in UK (NSTA, TCE, OPRD, HSEx) with large **support from stakeholders**

